

Supplemental Amendment to the Specification, Response and Remarks for application 8/ 11
10/037, 718 Applicants MCGINNIS ET AL. December 17, 2005; submitted by fax to 571-273-8300

Remarks

Regarding amendments to the specification This subject matter is taken from the inventor's paper and each paragraph that is requested to be added to the Specification cites the (or a) part of the paper from which the subject matter is taken or which offers support for the subject matter. In general the wording of the new paragraphs is very close to the wording in the paper. And in general the order of the paragraphs is the same as the order in which the subject matter occurs in the paper.

Applicants will fax copies of the cited pages in the paper cited for the Examiner's convenience; and these pages will include markings of the appropriate paper page sections and corresponding new Specification paragraphs to aid the Examiner. In addition, a copy of the paper was included with the IDS for the parent application, 09/623, 068, now abandoned. It should be noted that the entire paper is now freely available online without charge in pdf format from the publisher, Blackwell-Synergy, at webaddress <http://www.blackwell-synergy.com/loi/ahg>.

Applicants also respectfully submit the following remarks for the record.

Regarding new apparatus claim 44 Remarks regarding new claim 44 were included in the recently filed Supplemental Amendment/Response of November 2005. In those Remarks the applicants discussed the Examiner's points of rejection in the parent application (09/623, 068) and new claim 44 has been submitted in response to the rejections. Applicants wish to state for the record that they have not disclaimed any legal equivalent of the invention or inventions defined by claim 44. Applicants respectfully submit that such a disclaimer was not and is not necessary for patentability. Applicants respectfully submit that the scope of the claim includes such equivalents. And applicants note that the present application does describe equivalents (see paragraph [0329]).

Regarding claims with the limitation "wherein the genotype data/sample allele frequency data is genotype data or sample allele frequency data" the applicants respectfully submit the following comments. Some claims, such as claim 45 and several others, contain the limitation "*wherein the genotype data/sample allele frequency data is genotype data or sample allele frequency data*". Applicants wish to state for the record that they have not disclaimed any legal equivalent of the invention or inventions defined by any claim with the limitation "*wherein the genotype data/sample allele frequency data is genotype data or sample allele frequency data*". Applicants respectfully submit that such a disclaimer was not and is not necessary for patentability. Applicants respectfully submit that the scope of each such claim includes such equivalents. And applicants note that the present application does describe equivalents (see paragraph [0329]).

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Regarding the limitation “wherein the group of covering markers is not an essentially one-dimensional panel of markers” applicants respectfully submit the following comments. Some pending claims, such as claim 19, contain this limitation. Applicants have previously commented on this limitation in the Remarks of the Supplemental Amendment/Response of January 26, 2005. For the record applicants note that an example of a conventional linkage study is cited in paragraph [0018] (Levinson, et. al.). As stated in [0018], the average spacing of markers in the study was 11 centiMorgans. A reading of this paper (p. 744) shows that intermarker distance was as little as about 1.1 cM (one tenth average) on chromosome 12. And intermarker distance was as great as about 54 cM (5 times average) on chromosome X. Thus intermarker spacing in this example conventional linkage study varied from at least about one tenth average to about five times average.

As was known in the art at the time of filing, average marker spacing is generally a rough measure of closeness (in one dimension, the chromosomal location dimension) of one or more linkage study markers to points in the genome that could be the location of a sought trait-causing polymorphism. Levinson, et. al. and other examples cited in [0018] are nonlimiting examples that illustrate the essentially one-dimensional perspective [0020] or view [0035] of conventional techniques described in the application. As was known in the art at the time of filing and is described in the application [0035], conventional (essentially one-dimensional) techniques were essentially based on using one-dimensional closeness (in the chromosomal location dimension) of one or more markers to a sought trait-causing polymorphism to achieve linkage.

Regarding “increased power of association-based linkage tests” described in the application, applicants respectfully submit the following comments for the record. This increased power as m approaches p and δ approaches δ_{max} is described in many places in the application, for example in paragraphs [0029], [0052], [0053], [0079], [0286] to [0289] and [0296] to [0300]. This increased power is contrasted with the “greatly diminished” power of association studies predicted by Muller-Mhysok and Abel, see [0027] and [0029]. Similarly, in the inventor’s paper, this increased power is also contrasted with the “weakness of TDT power when the m/p ratio departs from unity and δ is not close to δ_{max} ” predicted by Muller-Mhysok and Abel, see p. 166 of Annals of Human Genetics, vol 62, pp. 159-179. (The inventor’s paper is part of the description through incorporation by reference see [0333].) In addition, this paper contains calculations, observations and a general framework for determining the increased power of the TDT in many different situations see [0029] and pp. 161, and 163 to 168 of the paper. This increased power (determinable through the general framework in the inventor’s paper) is also present and true for other association-based linkage tests see [0029], [0285] and [0289].

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The inventor's calculations indicate that the power of the TDT and other association-based linkage tests is not markedly diminished or dramatically weakened as soon as the m/p ratio departs from unity and, or δ is not close to δ_{\max} as indicated by Muller-Myshok and Abel. The TDT and other association-based tests have increased power due to similarity of allele frequencies m and p , in more common, typical situations even when the ratio m/p departs significantly from unity and, or δ is not close to δ_{\max} see [0027] and [0029]. And it is practical to use this increased power in association-based linkage studies to detect evidence for linkage.

Conventional techniques suffer from a kind of one-dimensional lack of depth perception that decreases their effectiveness, see [0035], [0042]. The new, two-dimensional perspective or view of two-dimensional linkage study techniques is more powerful, effective and systematic, see for example [0035], [0042], [0079].

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Conclusion

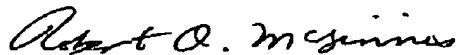
An RCE has been filed in the previous Amendment/Response of September 13, 2005 and fees have been paid. The Amendment/Response of September 13, 2005 addressed each point of rejection in the Final Office Action of 5/13/2005. Claims 6-9 and 15-19 were allowed in the Final Office Action mailed May 13, 2005. Claims 10-14 and 20-24 were rejected in that Final Office Action.

In the recent, previously filed Supplemental Amendment/Response, in response to the rejections in the Final Office Action applicants canceled claims 10, 12, 13, 20, 22 and 23; and claims 14, 21 and 24 were amended. Clarification regarding claims 14 and 24 was also respectfully submitted. Applicants also amended allowed claims 6 and 16 with a slight change in terminology to make the claims more closely conform to the terminology in the Specification and the newly amended Abstract. (These amendments did not, however, change the scope of either claim 6 or 16.) Remarks/Arguments in the Supplemental Amendment/Response also addressed each point of rejection in the Final Office Action. New claims 26-47 were also added and extra claim fees were paid. New claim 39 is, however, essentially the same (same scope) as former independent claim 3, filed 9/03/2003, which was subsequently allowed, but was canceled to avoid a double patenting rejection in the parent application 09/947, 768, now abandoned. And new independent (apparatus) claim 44 recites a novel, unobvious structural element limitation that is also recited in an already allowed independent claim in the present application. And this structural element limitation is the basis for patentability of the already allowed claim.

In this Supplemental Amendment to the Specification, Response and Remarks applicants have requested that fourteen new paragraphs be added to the Specification. The subject matter in these added paragraphs is taken directly from the inventor's paper, which is part of the Specification through incorporation by reference. Some additional remarks have also been submitted. And applicants respectfully request that the Examiner consider these Remarks and enter them in the record.

For the reasons advanced above, applicants respectfully submit that the application is now in condition for allowance and that action is earnestly solicited.

Respectfully submitted,



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